

Safety Data Sheet File version: 1

Butanol-2, 99.5% SDS Date: 28 Nov 2016

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 99.5%(v/v) 2-Butanol SYNONYMS: sec-Butyl alcohol

PRODUCT CODES: 1008396 1008397

MANUFACTURER: Rigaku Reagents ADDRESS: 9009 New Trails Drive The Woodlands, TX 77381

USA

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EMAIL: ReagentOrders@Rigaku.com

CHEMICAL NAME: 2-Butanol CHEMICAL FORMULA: C₄H₁₀O

PREPARED BY: Rigaku Reagents

SECTION 1 NOTES:

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

OSHA HAZARDS: Flammable liquid, irritant

GHS CLASSIFICATION

Flammable liquids (Category 3) Acute toxicity, Oral (Category 5) Acute toxicity, Dermal (Category 5)

Eye irritation (Category 2A)

Specific target organ toxicity - single exposure (Category 3)

GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS



Signal word: Warning Hazard statement(s):

H226 Flammable liquid and vapor.

H303 + H313 May be harmful if swallowed or in contact with skin.

H319 Causes serious eye irritation.

H335 + H336 May cause respiratory irritation, and drowsiness or dizziness.

Precautionary statement(s):

P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

POTENTIAL HEALTH EFFECTS:

EYES: Causes eye irritation.

SKIN: Harmful if absorbed through skin. May cause skin irritation.

INGESTION: May be harmful if swallowed.

INHALATION: May be harmful if inhaled. May cause respiratory tract irritation. Vapors may cause drowsiness and dizziness.

SECTION 2 NOTES:

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

SDS



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INGREDIENTS: 99.5%(v/v) 2-Butanol

SODIUM FLUORIDE:

CAS NO. % WT % VOL 78-92-2 ≥99.5

> mg/m3 ppm

OSHA PEL-TWA: 100 305 **OSHA PEL STEL:** 150 450

ACGIH TLV-TWA: 100 **ACGIH TLV STEL:**

SECTION 3 NOTES:

SECTION 4: FIRST AID MEASURES

EYES: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

SKIN: Wash off with soap and plenty of water. Consult a physician.

INGESTION: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

INHALATION: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

SECTION 4 NOTES:

SECTION 5: FIRE-FIGHTING MEASURES

FLASH POINT:

F: 81 ° **C**: 27 °

AUTOIGNITION TEMPERATURE:

F: No data available

C: No data available

NFPA HAZARD CLASSIFICATION

AMMABILITY: 3 **REACTIVITY: 0** HEALTH: 2

HMIS HAZARD CLASSIFICATION

HEALTH: 2 FLAMMABILITY: 3 **REACTIVITY: 0**

EXTINGUISHING MEDIA: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products formed under fire conditions. - Carbon oxides

SECTION 5 NOTES: Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

ENVIRONMENTAL PRECAUTIONS: Prevent further leakage or spillage if safe to do so. Do not let product enter drains.



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METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

SECTION 6 NOTES:

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

SECTION 7 NOTES:

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

EYE PROTECTION: Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

SKIN PROTECTION: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Impervious clothing, flame retardant antistatic protective clothing, the type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

WORK HYGIENIC PRACTICES: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

SECTION 8 NOTES:

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: clear, colorless

PHYSICAL STATE: liquid, clear

pH AS SUPPLIED: No data available pH (Other): No data available

BOILING POINT:

F: 208 ° **C**: 98 °

FREEZING POINT:

F: -175 ° **C**: -115 °

VAPOR PRESSURE (mmHg): 11.5

F: 68 ° **C**: 20 °

VAPOR DENSITY (AIR = 1): 2.56

SPECIFIC GRAVITY (H2O = 1): 0.808

<u>⊅!!</u>

F: 77°

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> 25° C:

EVAPORATION RATE: No data available

SOLUBILITY IN WATER: soluble

PERCENT SOLIDS BY WEIGHT: none

VISCOSITY: No data available

F: No data available C: No data available

SECTION 9 NOTES:

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable under recommended storage conditions.

CONDITIONS TO AVOID (STABILITY): Heat, flames and sparks.

INCOMPATIBILITY (MATERIAL TO AVOID): Acids, acid chlorides, acid anhydrides, oxidizing agents, halogens, peroxides

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Hazardous decomposition products formed under fire conditions. - Carbon oxides. Other decomposition products - no data available

SECTION 10 NOTES:

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:

ORAL LD50: Rat - 2,193 mg/kg; Remarks: Behavioral: Somnolence (general depressed activity). Behavioral: Ataxia. Behavioral:

Coma

INHALATION LC50: No data available **DERMAL LD50:** Rat - > 2,000 mg/kg

SKIN CORROSION/IRRITATION: No data available

SERIOUS EYE DAMAGE/EYE IRRITATION: No data available RESPIRATORY OR SKIN SENSITIZATION: No data available

GERM CELL MUTAGENICITY: No data available

CARCINOGENICITY:

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as

probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by

NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by

OSHA.

REPRODUCTIVE TOXICITY: Rat - Inhalation; Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Musculoskeletal system.

SECTION 11 NOTES:

SECTION 12: ECOLOGICAL INFORMATION

TOXICITY TO FISH: LC50 - Pimephales promelas (fathead minnow) - 3,670 mg/l - 96 h



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TOXICITY TO DAPHNIA AND OTHER AQUATIC INVERTEBRATES: EC50 - Daphnia magna (Water flea) - 4,227 mg/l - 48 h; EC100 - Daphnia magna (Water flea) - 5,000 mg/l - 24 h

PERSISTENCE AND DEGRADABILITY

No data available

BIOACCUMULATIVE POTENTIAL

No data available

MOBILITY IN SOIL

No data available

PBT AND vPvB ASSESSMENT

No data available

SECTION 12 NOTES:

SECTION 13: DISPOSAL CONSIDERATIONS

PRODUCT: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

CONTAMINATED PACKAGING: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION

PROPER SHIPPING NAME: Butanols
HAZARD CLASS: 3
ID NUMBER: 1120
PACKING GROUP: III
MARINE POLLUTANT: No
POISON INHALATION HAZARD: No

WATER TRANSPORTATION

PROPER SHIPPING NAME: BUTANOLS HAZARD CLASS: 3

ID NUMBER: 1120

PACKING GROUP: III EMS-No: F-E, S-D

MARINE POLLUTANT: No

AIR TRANSPORTATION

PROPER SHIPPING NAME: Butanols
HAZARD CLASS: 3
ID NUMBER: 1120
PACKING GROUP: III

SECTION 14 NOTES:

SECTION 15: REGULATORY INFORMATION

OSHA HAZARDS: Flammable liquid, irritant

SARA 302 COMPONENTS: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 COMPONENTS: The following components are subject to reporting levels established by SARA Title III, Section 313:

Eutan-2-ol CAS-No. 78-92-2



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SARA 311/312 HAZARDS: Fire hazard, acute health hazard

MASSACHUSETTS RIGHT TO KNOW COMPONENTS:

CAS-No.

Butan-2-ol 78-92-2

PENNSYLVANIA RIGHT TO KNOW COMPONENTS:

CAS-No.

Butan-2-ol 78-92-2

NEW JERSEY RIGHT TO KNOW COMPONENTS:

CAS-No.

Butan-2-ol 78-92-2

CALIFORNIA PROP. 65 COMPONENTS: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 15 NOTES:

SECTION 16: OTHER INFORMATION

DISCLAIMER: The above information is believed to be correct but does not necessarily include all information and should be used only as a guide. The information in this document is based on our current knowledge and applies to the product with regard to appropriate safety precautions. This document does not represent any guarantee of the properties of the product. Rigaku Reagents will not be held liable for any damage resulting from handling or contact with the above product.